



09/900 886

ajc

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**Our File:** 10857.321

**Applicant:** Gholamabbas Hemiari et al.

**Patent No.:** 6,928,189 B2

**Issued:** August 9, 2005

**Group Art Unit** 2625

**Examiner:** Bavesh M. Mehta

**Title:** SYSTEM AND METHOD FOR THE AUTOMATIC  
EXTRACTION OF LINEAR FEATURES FROM DIGITAL  
IMAGERY

Certificate  
SEP 01 2005  
of Correction

**REQUEST FOR CERTIFICATE OF CORRECTION**  
**UNDER 37 CFR 1.323 AND 35 USC 255**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450  
U.S.A.

Dear Sir:

The Patentee hereby respectfully requests the Commissioner to issue a Certificate of Correction for the above-identified patent in accordance with the accompanying form PTO/SB/44 submitted herewith, in duplicate.

Accordingly, it is respectfully requested that a Certificate of Correction under 37 CFR 1.323 and 35 USC 255 be issued.

SEP 02 2005

**REMARKS**

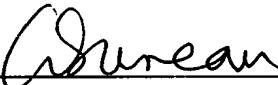
A copy of the first page of US Patent No. 6,928,189 is enclosed.

The title of the patent should read "SYSTEM AND METHOD FOR THE AUTOMATIC EXTRACTION OF LINEAR FEATURES FROM DIGITAL IMAGERY" as amended by a letter to the Commissioner of Patents and Trademarks dated October 4, 2001 and as it appears on the Corrected Filing Receipt issued in response thereto. Copies of both documents are enclosed.

The name of the Assignee should read "UNIVERSITÉ DE SHERBROOKE" as it appears on the Assignment of Invention filed with the application, a copy of which is enclosed.

Respectfully submitted,

GOUDREAU GAGE DUBUC

  
\_\_\_\_\_  
Gwendoline Bruneau

Reg. No. 55,916

Date: August 24, 2005

Gwendoline Bruneau  
**GOUDREAU GAGE DUBUC**  
3400 Stock Exchange Tower  
P.O. Box 242, 800 Place Victoria  
Montreal (Quebec) Canada H4Z 1E9  
Phone: (514) 397-5195  
E-mail: gbruneau@ggd.com



US006928189B2

(12) **United States Patent**  
Hemiri et al.

(10) Patent No.: US 6,928,189 B2  
(45) Date of Patent: Aug. 9, 2005

## (54) AUTOMATIC EXTRACTION OF LINEAR FEATURES FROM DIGITAL IMAGERY

(75) Inventors: Gholamabbas Hemiri, Sherbrooke (CA); Denis Morin, Sherbrooke (CA); Dong-Chen He, Sherbrooke (CA)

(73) Assignee: Universite de Sherbrooke, Sherbrooke (CA)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 744 days.

(21) Appl. No.: 09/900,886

(22) Filed: Jul. 10, 2001

## (65) Prior Publication Data

US 2002/0028019 A1 Mar. 7, 2002

## (30) Foreign Application Priority Data

Jul. 11, 2000 (CA) ..... 2313803

(51) Int. Cl.<sup>7</sup> ..... G06K 9/46

(52) U.S. Cl. ..... 382/190; 345/443; 345/545; 382/125; 382/159; 382/281; 382/302; 382/305; 707/2; 707/4; 707/101; 707/104.1

(58) Field of Search ..... 345/418, 441, 345/443, 543, 545; 382/118, 147, 151, 159, 203, 199, 224, 276, 281, 190, 124, 125, 202, 258, 280, 305; 707/4, 100, 101, 104.1

## (56)

## References Cited

## U.S. PATENT DOCUMENTS

- 5,418,892 A \* 5/1995 Aghajan et al. .... 345/418  
5,561,718 A \* 10/1996 Trew et al. .... 382/118  
5,638,465 A \* 6/1997 Sano et al. .... 382/281  
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6,529,916 B2 \* 3/2003 Bergman et al. .... 707/104.1  
6,597,800 B1 \* 7/2003 Murray et al. .... 382/103

\* cited by examiner

Primary Examiner—Bhavesh M. Mehta

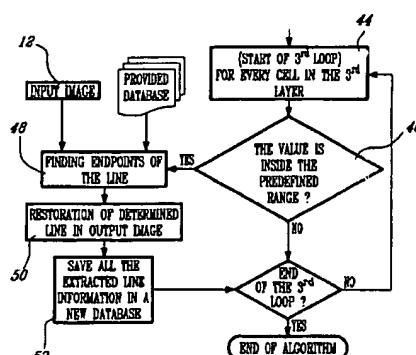
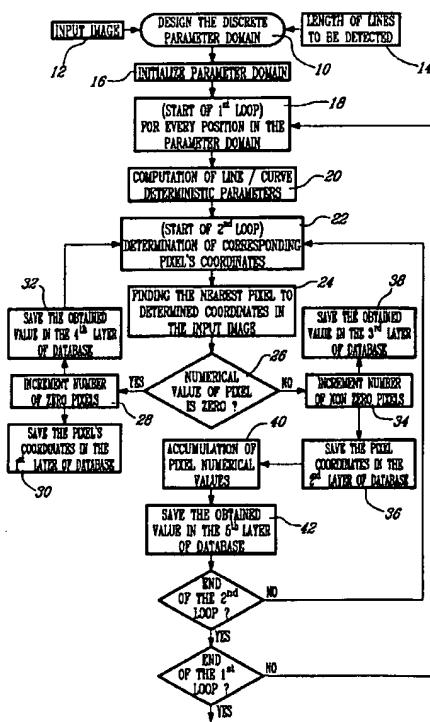
Assistant Examiner—Gregory Desire

(74) Attorney, Agent, or Firm—Goudreau Gage Dubuc

## (57) ABSTRACT

A method and system for the extraction of linear features from digital imagery is described herein. The proposed methodology is based on the tridimensional Radon transformation and on the generation of a multi-layer database having separate layers containing different types of information to allow the reconstruction of an output image where the linear features of the input image are restored.

9 Claims, 6 Drawing Sheets



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**In re application of** *Gholamabbas Hemiari et al.*  
**Serial No.** **09/900,886**  
**Filed** **July 10, 2001**  
**Title:** **System and Method for the Automatic Extraction  
of Linear Features from Digital Imagery**  
**Group Art Unit:** **2621**  
**Our file:** **10857.321**  
**ML/fc**

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October 4, 2001

Honorable Commissioner of Patents and Trademarks  
Washington, D.C. 20231

Sir:

We enclose herewith a copy of the official Filing Receipt recently received from the United States Patent Office. The title of the invention should read "System and Method for the Automatic Extraction of Linear Features from Digital Imagery".

Consequently, you will find attached hereto a duly executed "Declaration and Power of Attorney for Patent Application" for your records.

It is therefore respectfully requested that the Patent Office issue a corrected filing certificate for the present patent application.

Respectfully submitted,

by:

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*Marc Lupien*  
Registration No. 40461

Marc Lupien  
GOUDREAU GAGE DUBUC & MARTINEAU WALKER  
3400 Stock Exchange Tower  
P.O. Box 242, Victoria Square  
Montréal, Québec, Canada  
H4Z 1E9  
Telephone (514) 397-7594



**UNITED STATES PATENT AND TRADEMARK OFFICE**

COMMISSIONER FOR PATENTS  
 UNITED STATES PATENT AND TRADEMARK OFFICE  
 WASHINGTON, D.C. 20231  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	DRAWINGS	TOT CLAIMS	IND CLAIMS
09/900,886	07/10/2001	2623	355	ML/10857.321	6	15	2

O I P E  
AUG 29 2005

Marc Lupien  
 c/o GOUDREAU GAGE DUBUC  
 Stock Exchange Tower  
 800 Place Victoria, Suite 3400  
 Montreal, QC H4Z 1E9  
 CANADA

**CONFIRMATION NO. 5875**  
**CORRECTED FILING RECEIPT**



\*OC00000006960033\*

Date Mailed: 10/24/2001

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Customer Service Center. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

**Applicant(s)**

Gholamabbas Hemmari, Sherbrooke, CANADA;  
 Denis Morin, Sherbrooke, CANADA;  
 Dong-Chen He, Sherbrooke, CANADA;

**Domestic Priority data as claimed by applicant**

**Foreign Applications**

CANADA 2,313,803 07/11/2000

If Required, Foreign Filing License Granted 08/23/2001

Projected Publication Date: 01/17/2002

Non-Publication Request: No

Early Publication Request: No

**\*\* SMALL ENTITY \*\***

**Title**

System and method for the automatic extraction of linear features from digital imagery

**Preliminary Class**

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**LICENSE FOR FOREIGN FILING UNDER  
Title 35, United States Code, Section 184  
Title 37, Code of Federal Regulations, 5.11 & 5.15**

**GRANTED**

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Office of Export Administration, Department of Commerce (15 CFR 370.10 (j)); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

**NOT GRANTED**

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

# ASSIGNMENT OF INVENTION

## UNIVERSAL

WHEREAS, we 1) Gholamabbas Hemiari 2) Denis Morin 3) Dong-chan He

whose full address are 1) 740 McGregor, App. 203, Sherbrooke, Québec, CANADA, J1L 1V7

2) 497 Vimy, Sherbrooke, Québec, CANADA, J1J 3M8 3) 2578 Troyes, Sherbrooke, Québec, CANADA, J1K 1W9

(hereinafter referred to as the assignor) have invented certain improvements in AUTOMATIC EXTRACTION OF LINEAR FEATURES FROM DIGITAL IMAGERY

described in a Canadian patent application filed on July 11, 2000.

and:

WHEREAS UNIVERSITÉ DE SHERBROOKE

whose full post office address is Bureau de liaison entreprises-Université, Sherbrooke, Québec CANADA, J1K 2R1

(hereinafter referred to as the assignee), is desirous of acquiring the entire right, title and interest in and to said invention or inventions and in and to any and all patents to be obtained therefore;

NOW, THEREFORE, in consideration of One Dollar (\$1.00) and other valuable consideration, the receipt of which is hereby acknowledged, we have and by these presents do hereby sell, assign and transfer unto said assignee, its successors and assigns, the entire right, title and interest in and to said invention or inventions, as described in the aforesaid application, in any form or embodiment thereof, and in and to the aforesaid application; and in and to any applications filed in any foreign country based thereon, including the right to file said foreign applications under the provisions of the International Convention; also the entire right, title and interest in and to any and all patents, reissues or extensions thereof to be obtained in this or any foreign country upon said invention or inventions, and any divisional, continuation, continuation-in-part, substitute application(s) or supplementary disclosure(s) which may be filed upon said invention or inventions, in any country; and we hereby authorize and request the issuing authority to issue any and all patents on said application or applications to said assignee.

We further agree without any payment by said assignee other than expenses incurred by the undersigned, to communicate to said assignee, its representatives or agents, any facts relating to said invention or inventions, including evidence for interference purposes or for other proceedings, whenever requested; testify in any interference, litigation or other proceedings, whenever requested; and execute and deliver, on

equest, all lawful papers required to make any of the foregoing provisions effective, and likewise make these provisions binding upon our heirs, legal representatives, administrators and assigns.

Les soussignés désirent que la présente cession soit rédigée en anglais. The undersigned  request that the present assignment be in English.

IN WITNESS WHEREOF, we have hereunto set our hands and seal this

7<sup>th</sup> day of june 2001.

Michelle Di post  
Witness

G.Hemani  
Assignor: Gholamabbas Hemiari

Michelle Di post  
Witness

D.Morin  
Assignor: Denis Morin

Michelle Di post  
Witness

Dong-chan He  
Assignor: Dong-chan He

**UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION**

PATENT NO. : 6,928,189

*B2*Page 1 of 1

APPLICATION NO.: 09/900,886

ISSUE DATE : August 9, 2005

INVENTOR(S) : Gholamabbas Hemياري, Denis Morin, Dong-Chen He

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On cover page:

Item (54) should read:

SYSTEM AND METHOD FOR THE AUTOMATIC EXTRACTION OF LINEAR FEATURES FROM DIGITAL IMAGERY

Item (73) should read:

UNIVERSITÉ DE SHERBROOKE

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Gwendoline Bruneau, c/o Goudreau Gage Dubuc, Stock Exchange Tower, Suite 3400, P.O. Box 242, 800 Place Victoria, Montreal, Quebec, Canada H4Z 1E9

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

*SEP 02 2005*